

Abstract

A microtransformer for a high-performance system-on-chip power supply is disclosed. Through-wafer openings in a substrate allow the primary and secondary wiring on both surfaces of the silicon substrate. An insulating silicon oxide layer is first deposited on all surfaces of the substrate. A magnetic film is further deposited on the silicon oxide layer followed by the application of another insulating layer. Coils are fabricated next by patterned deposition on both sides of the substrate and through the holes. The coils can be, e.g., single coils or primary or secondary coils of a transformer structure, with secondary having one or more output taps to supply different output voltages. For better flux closure, various magnetic layers and insulators can be deposited on top of the windings.